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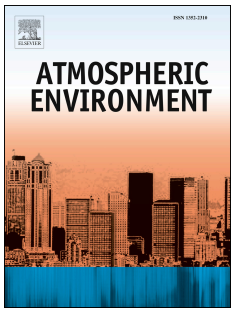

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Gabriele Battista, Roberto de Lieto Vollaro

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Correlation between air pollution and weather data in urban areas: assessment of the city of Rome (Italy) as spatially and temporally independent regarding pollutants

Gabriele Battista[a], Roberto de Lieto Vollaro[a]

[a] *University of Roma TRE, Engineering Department, Via della Vasca Navale 79, Rome 00146 Italy*

Abstract

Air pollution represents the biggest environmental risk for health. It is so widespread and it represents one of the main problems of the worldwide, especially because it is emitted by so many different types of sources. The pollutants can originate directly by exhausted or they can be formed because of the reaction with the atmosphere. The first one includes particulate matter and gaseous pollutants such as sulfur oxides, nitrogen oxides, and carbon oxides. The second one includes the ozone formed from nitrogen oxides and hydrocarbons, and particulate sulfate and nitrate aerosols created in the atmosphere from sulfur and nitrogen oxide gases. During the entire life course, people are exposed to the pollutants and suffer from different consequences depending on the age. The first nine month of life are generally recognized as more critical than latter time periods. The mortality associated to air pollutant exposure is main related to the concentrations of NO_x, ozone, carbon monoxide, sulfur dioxides and particular matter. More than 92% of the world's population lives in places where air quality levels exceed the standards. In 2012, one out of every nine deaths was the result of air pollution-related conditions. In 2016 about 3 million deaths a year were linked to exposure to outdoor air pollution. In the last few years many epidemiological studies have shown associations between air pollutant concentrations and human health. Apart from people, even monuments and artworks can be damaged by pollution, especially in city centres. Furthermore, urbanization modified microclimate conditions of the cities, and, together with traffic and domestic heating, led to a discomfort of living conditions. For these reasons,